

GLASPER et al
Appl. No. 10/520,850
January 3, 2007

AMENDMENTS TO THE CLAIMS:

Please amend claim 26 as follows

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (previously presented) A method of making a photodetector circuit incorporating a photodiode, the method including the steps of:

providing a first electrically insulating layer on a semiconductor substrate;

forming a first window in the first insulating layer exposing an area of the substrate within the first window;

forming a guard ring in the exposed area of the substrate within the first window;

providing a second electrically insulating layer covering the exposed area of the substrate within the first window;

forming a second window in the second insulating layer exposing a selected area of the substrate within the first window;

growing on the selected area of the substrate exposed by the second window an epitaxial layer providing an active region of the photodiode detector such that the edges of the epitaxial layer are spaced from the inner periphery of the first window; and

removing any remaining portion of said second insulating layer.

2. (original) A method according to claim 1, wherein the extent of the windows is such that the guard ring is overlapped by the edges of the epitaxial layer.

GLASPER et al
Appl. No. 10/520,850
January 3, 2007

3. (original) A method according to claim 1 or 2, wherein the second window is formed in the second insulating layer so as to leave a portion of the second insulating layer within the inner periphery of the first window which ensures, during growth of the epitaxial layer, that the edges of the epitaxial layer are spaced from the inner periphery of the first window.

4. (previously presented) A method according to claim 3, wherein, in said removing step, the remaining annular portion of the second insulating layer is removed by a wet oxide etch.

5. (previously presented) A method according to claim 1, wherein a further electrically insulating layer is provided on the first insulating layer covering the first window, and a further window is formed in the further insulating layer to expose a selected area of the substrate within the first window prior to the forming of the second insulating layer covering the exposed area of the substrate within the first window.

6. (original) A method according to claim 5, wherein the second insulating layer is substantially thinner than the further insulating layer.

7. (previously presented) A method according to claim 5, wherein the second insulating layer has a thickness of 10 nm to 50 nm.

8. (previously presented) A method according to claim 1, which includes the step of growing on top of the first-mentioned epitaxial layer a further epitaxial layer having a higher doping level than the first-mentioned epitaxial layer.

GLASPER et al
Appl. No. 10/520,850
January 3, 2007

9. (original) A method according to claim 8, wherein the further epitaxial layer contacts the substrate so as to be in ohmic contact with the guard ring in the substrate.

10. (previously presented) A method according to claim 1, wherein the photodiode detector is an avalanche photodiode.

11. (previously presented) A method according to claim 1, wherein readout circuitry is formed on the first insulating layer.

12. (cancelled).

13. (cancelled).

14. (cancelled).

15. (cancelled).

16. (cancelled).

17. (cancelled).

18. (cancelled).

GLASPER et al
Appl. No. 10/520,850
January 3, 2007

19. (cancelled).

20. (cancelled).

21. (cancelled).

22. (cancelled).

23. (cancelled).

24. (cancelled).

25. (previously presented) A method according to claim 7, wherein the second insulating layer has a thickness of about 25 nm.

26. (currently amended) A method of making a photodetector circuit incorporating a photodiode, the method including the steps of:

providing a first electrically insulating layer on a semiconductor substrate;

forming a first window in the first insulating layer exposing an area of the substrate within the first window;

forming a guard ring in the exposed area of the substrate within the first window;

GLASPER et al
Appl. No. 10/520,850
January 3, 2007

providing a second electrically insulating layer on said first electrically insulating layer and said first window;

forming a second window in the second electrically insulating layer exposing a portion of said substrate and a portion of said guard ring;

providing a third electrically insulating layer covering the exposed area of the substrate within the second window;

forming a third window in the third insulating layer exposing a selected area of the substrate and guard ring within the second window;

growing on the selected area of the substrate exposed by the third window an epitaxial layer providing an active region of the photodiode detector such that the edges of the epitaxial layer are spaced from the inner periphery of the first window; and

removing any remaining portion of said secondthird insulating layer.

27. (previously presented) A method according to claim 26, wherein the extent of the windows is such that the guard ring is overlapped by the edges of the epitaxial layer.

28. (previously presented) A method according to claim 26 or 27, wherein the third window is formed in the third insulating layer so as to leave a portion of the third insulating layer within the inner periphery of the first window which ensures, during growth of the epitaxial layer, that the edges of the epitaxial layer are spaced from the inner periphery of the first window.

GLASPER et al
Appl. No. 10/520,850
January 3, 2007

29. (previously presented) A method according to claim 28, wherein, in said removing step, the remaining annular portion of the third insulating layer is removed by a wet oxide etch.

30. (previously presented) A method according to claim 26, wherein the third insulating layer is substantially thinner than the second insulating layer.

31. (previously presented) A method according to claim 30, wherein the third insulating layer has a thickness of 10 nm to 50 nm.

32. (previously presented) A method according to claim 31, wherein the third insulating layer has a thickness of about 25 nm.

33. (previously presented) A method according to claim 26, which includes the step of growing on top of the first-mentioned epitaxial layer a further epitaxial layer having a higher doping level than the first-mentioned epitaxial layer.

34. (previously presented) A method according to claim 33, wherein the further epitaxial layer contacts the substrate so as to be in ohmic contact with the guard ring in the substrate.

35. (previously presented) A method according to claim 26, wherein the photodiode detector is an avalanche photodiode.

GLASPER et al
Appl. No. 10/520,850
January 3, 2007

36. (previously presented) A method according to claim 26, wherein readout circuitry is formed on the first insulating layer.